

FILE 'BIOSIS, MEDLINE, EMBASE, EMBAL, SCISEARCH, BIOTECHDS, CAPLUS'
ENTERED AT 15:42:13 ON 30 DEC 2002

L1 1210 S (DNA()SHUFFL?) OR (GENE()SHUFFL?)
L2 22 S L1 AND (COMPUTER? PROGRAM?)
L3 84 S L1 AND (COMPUTER? OR PROGRAM?)
L4 56 DUP REM L3 (28 DUPLICATES REMOVED)
L5 0 S L4 AND (CONCATEN?)

L4 ANSWER 15 OF 56 CAPLUS COPYRIGHT 2002 ACS
ACCESSION NUMBER: 2002:928292 CAPLUS

DOCUMENT NUMBER: 138:1055

TITLE: Computer-aided design of polynucleotides and
polypeptides having desired characteristics by string
manipulation using genetic algorithms

INVENTOR(S): Selifonov, Sergey A.; Stemmer, Willem P. C.;
Gustafsson, Claes; Tobin, Matthew; Del Cardayre,
Stephen; Patten, Phillip A.; Minshull, Jeremy

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 53 pp., Cont.-in-part of U. S.
Ser. No. 416,375, abandoned.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002183934	A1	20021205	US 2000-494282	20000118
CA 2320697	AA	20000720	CA 2000-2320697	20000118
CA 2320714	AA	20000720	CA 2000-2320714	20000118
EP 1108781	A2	20010620	EP 2001-102660	20000118
EP 1108781	A3	20010912		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
US 6368861	B1	20020409	US 2000-484850	20000118
JP 2002534965	T2	20021022	JP 2000-594067	20000118
JP 2002534966	T2	20021022	JP 2000-594068	20000118
PRIORITY APPLN. INFO.: US 1999-116447P P 19990119				
US 1999-118854P P 19990205				
US 1999-416375 B2 19991012				
US 1999-118813P P 19990205				
US 1999-141049P P 19990624				
US 1999-408392 A 19990928				
US 1999-408393 A 19990928				
US 1999-416837 A 19991012				

EP 2000-909922 A3 20000118
US 2000-494282 A2 20000118
WO 2000-US1202 W 20000118
WO 2000-US1203 W 20000118

L4 ANSWER 16 OF 56 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2002:850246 CAPLUS

DOCUMENT NUMBER: 137:348420

TITLE: Bioinformatic identification, cloning, sequences and
biocatalytic use of microbial thermostable
phosphatases and design of new thermostable
phosphatases

INVENTOR(S): Short, Jay M.; Mathur, Eric J.; Lee, Edd; Bylina,
Edward

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 47 pp., Cont.-in-part of U. S.
Ser. No. 202,681.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2002164751	A1	20021107	US 2001-902525	20010709
WO 9748416	A1	19971224	WO 1997-US10784	19970619
W: AU, CA, JP, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
PRIORITY APPLN. INFO.: US 1996-33752P P 19960619				
WO 1997-US10784 W 19970619				
US 1999-202681 A2 19991223				
US 1996-33752 A2 19960619				

L4 ANSWER 23 OF 56 MEDLINE DUPLICATE 1

ACCESSION NUMBER: 2002294349 MEDLINE

DOCUMENT NUMBER: 22030814 PubMed ID: 12034828

TITLE: eCodonOpt: a systematic computational framework for
optimizing codon usage in directed evolution experiments.

AUTHOR: Moore Gregory L; Maranas Costas D

CORPORATE SOURCE: Department of Chemical Engineering, The Pennsylvania
State

University, 112 Fenske Laboratory, University Park, PA
16802, USA.

SOURCE: NUCLEIC ACIDS RESEARCH, (2002 Jun 1) 30 (11) 2407-16.
Journal code: 0411011. ISSN: 1362-4962.

PUB. COUNTRY: England: United Kingdom
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
LANGUAGE: English
FILE SEGMENT: Priority Journals
ENTRY MONTH: 200206
ENTRY DATE: Entered STN: 20020530
Last Updated on STN: 20020614
Entered Medline: 20020613

L4 ANSWER 30 OF 56 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT
AND ISI

ACCESSION NUMBER: 2002-02508 BIOTECHDS

TITLE: In silico nucleic acid recombination method, termed as
genetic Algorithm Guided gene synthesis, involves selecting
cross-overs in sequence strings corresponding to nucleic
acids to be synthesized;
genetic operator, polymerase, ligase, and cross-over
sequence selection

AUTHOR: Gustafsson C; Minshuli J; Selifonov S A; Mundorff E; Emig R;
Govinadarajan S; Stemmer W P C; Giver L J; Tobin M; Del
Cardayrf S; Patten P A

PATENT ASSIGNEE: Maxygen

LOCATION: Redwood City, CA, USA.

PATENT INFO: WO 2001075767 11 Oct 2001

APPLICATION INFO: WO 2001-US10231 30 Mar 2001

PRIORITY INFO: US 2000-618579 18 Jul 2000; US 2000-539486 30 Mar 2000

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: WPI: 2001-648594 [74]

L4 ANSWER 32 OF 56 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT
AND ISI

ACCESSION NUMBER: 2002-05479 BIOTECHDS

TITLE: Selecting a crossover locations in biopolymers, useful for
particularly useful designing, engineering and generating new
proteins and genes with useful properties, by determining the
crossover disruption profiles of biopolymers;
with use of computer program analysis,
software, polymerase chain reaction and DNA primer

AUTHOR: WANG Z; VOIGT C A; MAYO S L; ARNOLD F H

PATENT ASSIGNEE: CALIFORNIA INST OF TECHNOLOGY

PATENT INFO: WO 2001090346 29 Nov 2001

APPLICATION INFO: WO 2000-US16831 23 May 2000

PRIORITY INFO: US 2001-283567 13 Apr 2001

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: WPI: 2002-122019 [16]

L4 ANSWER 33 OF 56 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2001:868669 CAPLUS

DOCUMENT NUMBER: 136:15894

TITLE: Methods involving identification and use of sites for
gene recombination in biopolymer engineering

INVENTOR(S): Wang, Zhen-Gang; Voigt, Christopher A.; Mayo, Stephen
L.; Arnold, Frances H.

PATENT ASSIGNEE(S): California Institute of Technology, USA

SOURCE: PCT Int. Appl., 139 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001090346	A2	20011129	WO 2001-US16831	20010523
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WO 2001090346	A3	20021010		
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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO,
RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ,
VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,
BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

US 2002045175	A1	20020418	US 2001-863765	20010523
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PRIORITY APPLN. INFO.: US 2000-207048P P 20000523

US 2000-235960P P 20000927

US 2001-283567P P 20010413

L4 ANSWER 37 OF 56 MEDLINE

ACCESSION NUMBER: 2002007192 MEDLINE

DOCUMENT NUMBER: 21145826 PubMed ID: 11248060

TITLE: Predicting crossover generation in DNA
shuffling.

AUTHOR: Moore G L; Maranas C D; Lutz S; Benkovic S J

CORPORATE SOURCE: Department of Chemical Engineering, 112A Fenske
Laboratory,

Pennsylvania State University, University Park, PA 16802,
USA.

SOURCE: PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES
OF THE

UNITED STATES OF AMERICA, (2001 Mar 13) 98 (6) 3226-31.

Journal code: 7505876. ISSN: 0027-8424.

PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 200112

ENTRY DATE: Entered STN: 20020121

Last Updated on STN: 20020121

Entered Medline: 20011204

L4 ANSWER 40 OF 56 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:227769 CAPLUS

DOCUMENT NUMBER: 132:261360

TITLE: Shuffling of codon-altered genes for forced evolution
of protein or nucleic acid products

INVENTOR(S): Patten, Phillip A.; Liu, Lu; Stemmer, Willem P. C.

PATENT ASSIGNEE(S): Maxygen, Inc., USA

SOURCE: PCT Int. Appl., 92 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 5

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2000018906	A2	20000406	WO 1999-US22588	19990928
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WO 2000018906	A3	20001026		
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W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ,
DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK,
MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ,
TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ,
MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

EP 1117777	A2	20010725	EP 1999-969739	19990928
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, FI

JP 2002537758	T2	20021112	JP 2000-572353	19990928
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CA 2320697	AA	20000720	CA 2000-2320697	20000118
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CA 2320714	AA	20000720	CA 2000-2320714	20000118
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EP 1108781 A2 20010620 EP 2001-102660 20000118
EP 1108781 A3 20010912
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
IE, FI
JP 2002534965 T2 20021022 JP 2000-594067 20000118
JP 2002534966 T2 20021022 JP 2000-594068 20000118
PRIORITY APPLN. INFO.: US 1998-102362P P 19980929
US 1999-117729P P 19990129
US 1999-118813P P 19990205
US 1999-141049P P 19990624
US 1999-116447P P 19990119
US 1999-118854P P 19990205
US 1999-408392 A 19990928
US 1999-408393 A 19990928
WO 1999-US22588 W 19990928
US 1999-416375 A 19991012
US 1999-416837 A 19991012
EP 2000-909922 A3 20000118
WO 2000-US1202 W 20000118
WO 2000-US1203 W 20000118

L4 ANSWER 42 OF 56 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:228717 CAPLUS

DOCUMENT NUMBER: 133:188546

TITLE: Shufflet: shuffling sequences while conserving the
k-let counts

AUTHOR(S): Coward, Eivind

CORPORATE SOURCE: Laboratoire Genome et Informatique, Universite de
Versailles Saint-Quentin-en-Yvelines, Versailles,
78035, Fr.

SOURCE: Bioinformatics (1999), 15(12), 1058-1059

CODEN: BOINFP; ISSN: 1367-4803

PUBLISHER: Oxford University Press

DOCUMENT TYPE: Journal

LANGUAGE: English

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE
FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 46 OF 56 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS

INC.DUPLICATE

6

ACCESSION NUMBER: 1997:486882 BIOSIS

DOCUMENT NUMBER: PREV199799786085

TITLE: Strategies for the in vitro evolution of protein function:
Enzyme evolution by random recombination of improved

sequences.

AUTHOR(S): Moore, Jeffrey C.; Jin, Hua-Ming; Kuchner, Olga; Arnold, Frances H. (1)

CORPORATE SOURCE: (1) Div. Chem. Chem. Eng., Mail Code 210-41, Calif. Inst. Technol., Pasadena, CA 91125 USA

SOURCE: Journal of Molecular Biology, (1997) Vol. 272, No. 3, pp. 336-347.

ISSN: 0022-2836.

DOCUMENT TYPE: Article

LANGUAGE: English

L4 ANSWER 47 OF 56 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS
INC.DUPLICATE

7

ACCESSION NUMBER: 1998:27656 BIOSIS

DOCUMENT NUMBER: PREV199800027656

TITLE: Parallel overlap assembly for the construction of computational DNA libraries.

AUTHOR(S): Kaplan, Peter D. (1); Ouyang, Qi; Thaler, David S.; Libchaber, Albert

CORPORATE SOURCE: (1) Phys. Dep., Univ. Pa., Philadelphia, PA 19104 USA

SOURCE: Journal of Theoretical Biology, (Oct. 7, 1997) Vol. 188, No. 3, pp. 333-341.

ISSN: 0022-5193.

DOCUMENT TYPE: Article

LANGUAGE: English

L4 ANSWER 50 OF 56 BIOTECHDS COPYRIGHT 2002 THOMSON DERWENT
AND ISI

ACCESSION NUMBER: 1995-08674 BIOTECHDS

TITLE: Searching sequence space;
use of recombination and exon shuffling as a means of in
vitro evolution and protein design

AUTHOR: Stemmer W P C

CORPORATE SOURCE: Affymax-Res.Inst.

LOCATION: Affymax Research Institute, 4001 Miranda Avenue, Palo Alto,
CA 94304, USA.

Email: pim_stemmer@qmgates.affymax.com

SOURCE: Bio/Technology; (1995) 13, 6, 549-53

CODEN: BTCHDA

ISSN: 0733-222X

DOCUMENT TYPE: Journal

LANGUAGE: English

L4 ANSWER 52 OF 56 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS
INC.DUPLICATE

ACCESSION NUMBER: 1995:20516 BIOSIS

DOCUMENT NUMBER: PREV199598034816

TITLE: DNA shuffling by random fragmentation
and reassembly: In vitro recombination for molecular
evolution.

AUTHOR(S): Stemmer, Willem P. C.

CORPORATE SOURCE: Affymax Res. Inst., 4001 Miranda Ave., Palo Alto, CA
94304

USA

SOURCE: Proceedings of the National Academy of Sciences of the
United States of America, (1994) Vol. 91, No. 22, pp.
10747-10751.

ISSN: 0027-8424.

DOCUMENT TYPE: Article

LANGUAGE: English

L4 ANSWER 53 OF 56 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS
INC.DUPLICATE

ACCESSION NUMBER: 1994:404913 BIOSIS

DOCUMENT NUMBER: PREV199497417913

TITLE: Rapid evolution of a protein in vitro by DNA
shuffling.

AUTHOR(S): Stemmer, Willem P. C.

CORPORATE SOURCE: Affymax Res. Inst., 4001 Miranda Ave., Palo Alto, CA
94304

USA

SOURCE: Nature (London), (1994) Vol. 370, No. 6488, pp. 389-391.

ISSN: 0028-0836.

DOCUMENT TYPE: Article

LANGUAGE: English